

## DETAILED ACTION

### ***Response to Arguments***

1. Applicant's arguments filed on March 14, 2008 have been fully considered but they are not persuasive.
2. The applicant argues that ***the method for determining registration areas according to dynamic partition units as described in claim 1 is not disclosed or suggested by Lee.*** (See applicant's Remarks, Page 6).
3. The examiner respectfully disagrees.
4. Lee et al. discloses a plurality of location areas that are determined so that the paging load is distributed among the plurality of location areas such that a partial paging load respective to each cell of the multicell wireless communication system is less than a respective load limit. Boundaries of the location areas are chosen to substantially minimize registration load within the multicell wireless communication system such that the overall cost of the wireless communication system can be minimized. A graph partitioning algorithm, such as a modified KL algorithm may be used to create the location areas and set the boundaries. See Abstract.

Lee et al. further discloses the method where the total number of VMLA registrations are minimized while ensuring that the load on every VMLA in the service area is less than the limit. A KL graph algorithm is used to find the optimal boundary setting of the VMLAs by adjusting boundaries of the VMLAs until the optimal boundary setting is determined. Loading characteristics (mobility data) based on historical

information and simulations are also used in determining the optimal boundary. See Col. 5, lines 61-66; Col. 7, lines 13-25 and Col. 11, lines 14-63.

Lee et al. discloses determining the "best cell", moving border cell from one of two VMLAs to the other VMLA. A determination is made as to the "best cell" and "best pair" of cells that would have the greatest positive impact and for determining balanced VMLAs. All possible beneficial combinations are considered with the optimal combination. Once the optimal combination is determined, the loads for the VMLAs are determined so that the loading constraint limit is satisfied. See Col. 12, line 6-Col. 13, line 39.

Lee et al. discloses dynamic partition units (grouping of cells) as also disclosed by applicant whereas ***at least one of the new partition units (i.e. second partition units) is determined by combining the original partition units (i.e. first partition units)***. On page 6 of applicant's Remarks, the applicant admits that Lee et al. discloses dynamic partition units for determining registration areas ***though the best pair of cells is considered in Fig. 7B, it is used for cell swapping***. The applicant further argues ***thus, it is also in nature a single cell moved from a VMLA to another***. The examiner is unsure as to what is meant by this statement because Lee et al. clearly describes the scenario of "best pair" of cells (dynamic partition units) for creating VMLAs (registration areas).

Therefore, Lee et al. discloses a method for determining registration areas (VMLAs) based on mobility data (loading characteristics and KL graph partitioning

algorithm) where the overall cost is minimized (lesser paging load and reducing registration loading). These registration areas are determined by finding the "best cell" and "best pair" cells for swapping that will have the greatest positive impact i.e. the loading constraint limit is satisfied.

Thus, Lee et al. discloses all of the limitations claimed in amended Claim 1.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al. (Lee), U.S. Patent No. 6,138,025.

**Regarding Claim 1**, Lee discloses a method for determining a plurality of registration areas in a wireless communication system, wherein the wireless communication system comprises a plurality of first registration areas, and each of the first registration areas comprises at least one of a plurality of first partition units, the method comprising the steps of: performing a registration area determining procedure according to a plurality of mobility data (**loading characteristics**) corresponding to the first partition units to determine a plurality of second registration areas, wherein each of the second registration areas comprises at least one of the first partition units: comparing an overall cost (**paging load and registration load**) of the first registration areas with an overall cost of the second registration areas; determining a plurality of

second partition units and a plurality of mobility data corresponding to the second partition units according to the result of comparison, wherein at least one of the second partition units is generated by combining at least two of the first partition units when the overall cost of the first registration areas is lower than or equal to the overall cost of the second registration areas, and at least one of the second partition units is generated by partitioning one of the first partition units when the overall cost of the first registration areas is higher than the overall cost of the second registration areas; and performing the registration area determining procedure according to the mobility data corresponding to the second partition units to determine a plurality of third registration areas, wherein each of the third registration areas comprises at least one of the second partition units. **(Col. 5, line 16-Col. 6, line 7).**

**Regarding Claim 2**, Lee discloses wherein the method is executed recursively until a plurality of  $(n + 1)$  th registration areas and  $n$ th partition units are determined that each of the  $(n + 1)$  th registration areas includes only one  $n$ th partition unit and the overall cost of the  $(n)$  th registration areas is smaller than or an equal to the overall cost of the  $(n + 1)$  th registration areas **(Col. 11, lines 37-63).**

**Regarding Claim 3**, Lee discloses wherein the mobility data at least include a plurality of mobility rates **(Col. 7, lines 13-25).**

**Regarding Claim 4**, Lee discloses wherein the mobility rates are determined by a plurality of traffic sources in the wireless communication system through at least one of the following operations which are gathering historical data, simulation and estimation **(Col. 7, lines 13-25).**

**Regarding Claim 5**, Lee discloses wherein the second partition units are determined based on a plurality of loading limits of the wireless communication system **(Col. 6, line 64-Col. 7, line 12)**.

**Regarding Claim 6**, Lee discloses wherein the loading limits at least include a plurality of constraints corresponding to any physical or virtual equipment in the wireless communication system **(Col. 4, lines 51-62)**.

**Regarding Claim 7**, Lee discloses wherein the registration area determining procedure is at least one of the K-L algorithm and the F-M algorithm **(Col. 11, lines 14-36)**.

**Regarding Claim 8**, Lee discloses wherein the registration area is determined by at least one of the following: a location area (LA) of a GSM system, a routing area (RA) of a packet-switched or a 3G systems, a registration location area (RLA)/overlapping location area (OLA) and a paging area of a PDC and a PHS system, a cell area (CA) of a 3G systems, and an UTRAN Registration Area of a UMTSWCDMA system **(Col. 4, line 51-Col. 5, line 4)**.

**Regarding Claim 9**, Lee discloses wherein when the first partition units are non-partitionable, generating the second partition units by combining at least two of the first partition units is performed **(Col. 12, line 6-Col. 13, line 23)**.

### ***Conclusion***

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Chiou et al., U.S. Publication No. 2004/0165561 discloses a system for constructing a mobility model for use in mobility management in a wireless communication system and method thereof.

Aji et al., U.S. Publication No. 2004/0044979 discloses a constraint-based global router for routing high performance designs.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shantell Heiber whose telephone number is (571)272-0886. The examiner can normally be reached on Monday-Friday 9:00am-5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester Kincaid can be reached on 571-272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. H./  
Examiner, Art Unit 2617  
June 16, 2008

/Lester Kincaid/  
Supervisory Patent Examiner, Art Unit 2617